

SEQUENCE LISTING

<110> University of Texas Health Science Center at San Antonio
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 Kannan, Thirumalai

<120> METHODS AND COMPOSITIONS FOR MYCOPLASMA PNEUMONIAE EXOTOXINS

<130> 9237.10WO

<150> US 60/508,607

<151> 2003-10-03

<160> 76

<170> PatentIn version 3.2

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<211> 591

<212> PRT

<213> Mycoplasma pneumoniae

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Met Pro Asn Pro Val Arg Phe Val Tyr Arg Val Asp Leu Arg Ser Pro
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Glu Glu Ile Phe Glu His Gly Phe Ser Thr Leu Gly Asp Val Arg Asn
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Phe Phe Glu His Ile Leu Ser Thr Asn Phe Gly Arg Ser Tyr Phe Ile
 35 40 45

Ser Thr Ser Glu Thr Pro Thr Ala Ala Ile Arg Phe Phe Gly Ser Trp
 50 55 60

Leu Arg Glu Tyr Val Pro Glu His Pro Arg Arg Ala Tyr Leu Tyr Glu
 65 70 75 80

Ile Arg Ala Asp Gln His Phe Tyr Asn Ala Arg Ala Thr Gly Glu Asn
 85 90 95

Leu Leu Asp Leu Met Arg Gln Arg Gln Val Val Phe Asp Ser Gly Asp
 100 105 110

Arg Glu Met Ala Gln Met Gly Ile Arg Ala Leu Arg Thr Ser Phe Ala
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Tyr Gln Arg Glu Trp Phe Thr Asp Gly Pro Ile Ala Ala Ala Asn Val
 130 135 140

Arg Ser Ala Trp Leu Val Asp Ala Val Pro Val Glu Pro Gly His Ala

145		150		155		160
His His Pro Ala Gly Arg Val Val Glu Thr Thr Arg Ile Asn Glu Pro						
		165		170		175
Glu Met His Asn Pro His Tyr Gln Glu Leu Gln Thr Gln Ala Asn Asp						
		180		185		190
Gln Pro Trp Leu Pro Thr Pro Gly Ile Ala Thr Pro Val His Leu Ser						
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Ile Pro Gln Ala Ala Ser Val Ala Asp Val Ser Glu Gly Thr Ser Ala						
		210		215		220
Ser Leu Ser Phe Ala Cys Pro Asp Trp Ser Pro Pro Ser Ser Asn Gly						
		225		230		235
Glu Asn Pro Leu Asp Lys Cys Ile Ala Glu Lys Ile Asp Asn Tyr Asn						
		245		250		255
Leu Gln Ser Leu Pro Gln Tyr Ala Ser Ser Val Lys Glu Leu Glu Asp						
		260		265		270
Thr Pro Val Tyr Leu Arg Gly Ile Lys Thr Gln Lys Thr Phe Met Leu						
		275		280		285
Gln Ala Asp Pro Gln Asn Asn Asn Val Phe Leu Val Glu Val Asn Pro						
		290		295		300
Lys Gln Lys Ser Ser Phe Pro Gln Thr Ile Phe Phe Trp Asp Val Tyr						
		305		310		315
Gln Arg Ile Cys Leu Lys Asp Leu Thr Gly Ala Gln Ile Ser Leu Ser						
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Leu Thr Ala Phe Thr Thr Gln Tyr Ala Gly Gln Leu Lys Val His Leu						
		340		345		350
Ser Val Ser Ala Val Asn Ala Val Asn Gln Lys Trp Lys Met Thr Pro						
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Gln Asp Ile Ala Ile Thr Gln Phe Arg Val Ser Ser Glu Leu Leu Gly						
		370		375		380
Gln Thr Glu Asn Gly Leu Phe Trp Asn Thr Lys Ser Gly Gly Ser Gln						
		385		390		395
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His Asp Leu Tyr Val Cys Pro Leu Lys Asn Pro Pro Ser Asp Leu Glu
 405 410 415

Glu Leu Gln Ile Ile Val Asp Glu Cys Thr Thr His Ala Gln Phe Val
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Thr Met Arg Ala Ala Ser Thr Phe Phe Val Asp Val Gln Leu Gly Trp
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Tyr Trp Arg Gly Tyr Tyr Tyr Thr Pro Gln Leu Ser Gly Trp Ser Tyr
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Gln Met Lys Thr Pro Asp Gly Gln Ile Phe Tyr Asp Leu Lys Thr Ser
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Lys Ile Phe Phe Val Gln Asp Asn Gln Asn Val Phe Phe Leu His Asn
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Lys Leu Asn Lys Gln Thr Gly Tyr Ser Trp Asp Trp Val Glu Trp Leu
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Lys His Asp Met Asn Glu Asp Lys Asp Glu Asn Phe Lys Trp Tyr Phe
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Ser Arg Asp Asp Leu Thr Ile Pro Ser Val Glu Gly Leu Asn Phe Arg
 530 535 540

His Ile Arg Cys Tyr Ala Asp Asn Gln Gln Leu Lys Val Ile Ile Ser
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Gly Ser Arg Trp Gly Gly Trp Tyr Ser Thr Tyr Asp Lys Val Glu Ser
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Asn Val Glu Asp Lys Ile Leu Val Lys Asp Gly Phe Asp Arg Phe
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 <212> PRT
 <213> Mycoplasma pneumoniae

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Glu Glu Ile Phe Glu His Gly Phe Ser Thr Leu Gly Asp Val Arg Asn
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Phe Phe Glu His Ile Pro Ser Thr Asn Phe Gly Arg Ser Tyr Phe Ile
 35 40 45

Ser Thr Ser Glu Thr Pro Thr Ala Ala Ile Arg Phe Phe Gly Ser Trp
 50 55 60

Leu Arg Glu Tyr Val Pro Glu His Pro Arg Arg Ala Tyr Leu Tyr Glu
 65 70 75 80

Ile Arg Ala Asp Gln His Phe Tyr Asn Ala Arg Ala Thr Gly Glu Asn
 85 90 95

Leu Leu Asp Leu Met Arg Gln Arg Gln Val Val Phe Asp Ser Gly Asp
 100 105 110

Arg Glu Met Ala Gln Met Gly Ile Arg Ala Leu Arg Thr Ser Phe Ala
 115 120 125

Tyr Gln Arg Glu Trp Phe Thr Asp Gly Pro Ile Ala Ala Ala Asn Val
 130 135 140

Arg Ser Ala Trp Leu Val Asp Ala Val Pro Val Glu Pro Gly His Ala
 145 150 155 160

His His Pro Ala Gly Arg Val Val Glu Thr Thr Arg Ile Asn Glu Pro
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Glu Met His Asn Pro His Tyr Gln Glu Leu Gln Thr Gln Ala Asn Asp
 180 185 190

Gln Pro Trp Leu Pro Thr Pro Gly Ile Ala Thr Pro Val His Leu Ser
 195 200 205

Ile Pro Gln Ala Ala Ser Val Ala Asp Val Ser Glu Gly Thr Ser Ala
 210 215 220

Ser Leu Ser Phe Ala Cys Pro Asp Trp Ser Pro Pro Ser Ser Asn Gly
 225 230 235 240

Glu Asn Pro Leu Asp Lys Cys Ile Ala Glu Lys Ile Asp Asn Tyr Asn
 245 250 255

Leu Gln Ser Leu Pro Gln Tyr Ala Ser Ser Val Lys Glu Leu Glu Asp

260	265	270
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290	295	300
Lys Gln Lys Ser Pro Phe Pro Gln Thr Ile Phe Phe Trp Asp Val Tyr		
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Leu Thr Ala Phe Thr Thr Gln Tyr Ala Gly Gln Leu Lys Val His Leu		
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Ser Val Ser Ala Val Asn Ala Val Asn Gln Lys Trp Lys Met Thr Pro		
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Gln Asp Ser Ala Ile Thr Gln Phe Arg Val Ser Ser Glu Leu Leu Gly		
370	375	380
Gln Thr Glu Asn Gly Leu Ser Trp Asn Thr Lys Ser Gly Gly Ser Gln		
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450	455	460
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Lys Ile Phe Phe Val Gln Asp Asn Gln Asn Val Phe Phe Leu His Asn		
485	490	495
Lys Leu Asn Lys Gln Thr Gly Tyr Ser Trp Asp Trp Val Glu Trp Leu		
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Lys His Asp Met Asn Glu Asp Lys Asp Glu Asn Phe Lys Trp Tyr Phe
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Ser Arg Asp Asp Leu Thr Ile Pro Ser Val Glu Gly Leu Asn Phe Arg
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His Ile Arg Cys Tyr Ala Asp Asn Gln Gln Leu Lys Val Ile Ile Ser
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Asn Val Glu Asp Lys Ile Leu Val Lys Asp Gly Phe Asp Arg Phe
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 <212> PRT
 <213> Mycoplasma pneumoniae

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Glu Glu Ile Phe Glu His Gly Phe Ser Thr Leu Gly Asp Val Arg Asn
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Phe Phe Glu His Ile Leu Ser Thr Asn Phe Gly Arg Ser Tyr Phe Ile
 35 40 45

Ser Thr Ser Glu Thr Pro Thr Ala Ala Ile Arg Phe Phe Gly Ser Trp
 50 55 60

Leu Arg Glu Tyr Val Pro Glu His Pro Arg Arg Ala Tyr Leu Tyr Glu
 65 70 75 80

Ile Arg Ala Asp Gln His Phe Tyr Asn Ala Arg Ala Thr Gly Glu Asn
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Leu Leu Asp Leu Met Arg Gln Arg Gln Val Val Phe Asp Ser Gly Asp
 100 105 110

Arg Glu Met Ala Gln Met Gly Ile Arg Ala Leu Arg Thr Ser Phe Ala
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Tyr Gln Arg Glu Trp Phe Thr Asp Gly Pro Ile Ala Ala Ala Asn Val
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Arg Ser Ala Trp Leu Val Asp Ala Val Pro Val Glu Pro Gly His Ala
 145 150 155 160

His His Pro Ala Gly Arg Val Val Glu Thr Thr Arg Ile Asn Glu Pro
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Glu Met His Asn Pro His Tyr Gln Glu Leu Gln Thr Gln Ala Asn Asp
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Gln Pro Trp Leu Pro Thr Pro Gly Ile Ala Thr Pro Val His Leu Ser
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Ile Pro Gln Ala Ala Ser Val Ala Asp Val Ser Glu Gly Thr Ser Ala
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Ser Leu Ser Phe Ala Cys Pro Asp Trp Ser Pro Pro Ser Ser Asn Gly
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Glu Asn Pro Leu Asp Lys Cys Ile Ala Glu Lys Ile Asp Asn Tyr Asn
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Leu Gln Ser Leu Pro Gln Tyr Ala Ser Ser Val Lys Glu Leu Glu Asp
 260 265 270

Thr Pro Val Tyr Leu Arg Gly Ile Lys Thr Gln Lys Thr Phe Met Leu
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Gln Ala Asp Pro Gln Asn Asn Asn Val Phe Leu Val Glu Val Asn Pro
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Lys Gln Lys Ser Ser Phe Pro Gln Thr Ile Phe Phe Trp Asp Val Tyr
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Gln Arg Ile Cys Leu Lys Asp Leu Thr Gly Ala Gln Ile Ser Leu Ser
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Ser Thr Ser Glu Thr Pro Thr Ala Ala Ile Arg Phe Phe Gly Ser Trp
 50 55 60

Leu Arg Glu Tyr Val Pro Glu His Pro Arg Arg Ala Tyr Leu Tyr Glu
 65 70 75 80

Ile Arg Ala Asp Gln His Phe Tyr Asn Ala Arg Ala Thr Gly Glu Asn
 85 90 95

Leu Leu Asp Leu Met Arg Gln Arg Gln Val Val Phe Asp Ser Gly Asp
 100 105 110

Arg Glu Met Ala Gln Met Gly Ile Arg Ala Leu Arg Thr Ser Phe Ala
 115 120 125

Tyr Gln Arg Glu Trp Phe Thr Asp Gly Pro Ile Ala Ala Ala Asn Val
 130 135 140

Arg Ser Ala Trp Leu Val Asp Ala Val Pro Val Glu Pro Gly His Ala
 145 150 155 160

His His Pro Ala Gly Arg Val Val Glu Thr Thr Arg Ile Asn Glu Pro
 165 170 175

Glu Met His Asn Pro His Tyr Gln Glu Leu Gln Thr Gln Ala Asn Asp
 180 185 190

Gln Pro Trp Leu Pro Thr Pro Gly Ile Ala Thr Pro Val His Leu Ser
 195 200 205

Ile Pro Gln Ala Ala Ser Val Ala Asp Val Ser Glu Gly Thr Ser Ala
 210 215 220

Ser Leu Ser Phe Ala Cys Pro Asp Trp Ser Pro Pro Ser Ser Asn Gly
 225 230 235 240

Glu Asn Pro Leu Asp Lys Cys Ile Ala Glu Lys Ile Asp Asn Tyr Asn
245 250 255

Leu Gln Ser Leu Pro Gln Tyr Ala Ser Ser Val Lys Glu Leu Glu Asp
260 265 270

Thr Pro Val Tyr Leu Arg Gly Ile Lys Thr Gln Lys Thr Phe Met Leu
275 280 285

Gln Ala Asp Pro Gln Asn Asn Asn Val Phe Leu Val Glu Val Asn Pro
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Lys Gln Lys Ser Ser Phe Pro Gln Thr Ile Phe Phe Trp Asp Val Tyr
305 310 315 320

Gln Arg Ile Cys Leu Lys Asp Leu Thr Gly Ala Gln Ile Ser Leu Ser
325 330 335

Leu Thr Ala Phe Thr Thr Gln Tyr Ala Gly Gln Leu Lys Val His Leu
340 345 350

Ser Val Ser Ala Val Asn Ala Val Asn Gln Lys Trp Lys Met Thr Pro
355 360 365

Gln Asp Ser Ala Ile Thr Gln Phe Arg Val Ser Ser Glu Leu Leu Gly
370 375 380

Gln Thr Glu Asn Gly Leu Phe Arg Asn Thr Lys Ser Gly Gly Ser Gln
385 390 395 400

His Asp Leu Tyr Val Cys Pro Leu Lys Asn Pro Pro Ser Asp Leu Glu
405 410 415

Glu Leu Gln Ile Ile Val Asp Glu Cys Thr Thr His Ala Gln Phe Val
420 425 430

Thr Met Arg Ala Ala Ser Thr Phe Phe Val Asp Val Gln Leu Gly Trp
435 440 445

Tyr Trp Arg Gly Tyr Tyr Tyr Thr Pro Gln Leu Ser Gly Trp Ser Tyr
450 455 460

Gln Met Lys Thr Pro Asp Gly Gln Ile Phe Tyr Asp Leu Lys Thr Ser
465 470 475 480

Lys Ile Phe Phe Val Gln Asp Asn Gln Asn Val Phe Phe Leu His Asn

485

490

495

Lys Leu Asn Lys Gln Thr Gly Tyr Ser Trp Asp Trp Val Glu Trp Leu
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Lys His Asp Met Asn Glu Asp Lys Asp Glu Asn Phe Lys Trp Tyr Phe
515 520 525

Ser Arg Asp Asp Leu Thr Ile Pro Ser Val Glu Gly Leu Asn Phe Arg
530 535 540

His Ile Arg Cys Tyr Ala Asp Asn Gln Gln Leu Lys Val Ile Ile Ser
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Gly Ser Arg Trp Gly Gly Trp Tyr Ser Thr Tyr Asp Lys Val Glu Ser
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Asn Val Glu Asp Lys Ile Leu Val Lys Asp Gly Phe Asp Arg Phe
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<211> 591
<212> PRT
<213> *Mycoplasma pneumoniae*

<400> 5

Met Pro Asn Pro Val Arg Phe Val Tyr Arg Val Asp Leu Arg Ser Pro
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Phe Phe Glu His Ile Leu Ser Thr Asn Phe Gly Arg Ser Tyr Phe Ile
35 40 45

Ser Thr Ser Glu Thr Pro Thr Ala Ala Ile Arg Phe Phe Gly Ser Trp
50 55 60

Leu Arg Glu Tyr Val Pro Glu His Pro Arg Arg Ala Tyr Leu Tyr Glu
65 70 75 80

Ile Arg Ala Asp Gln His Phe Tyr Asn Ala Arg Ala Thr Gly Glu Asn
85 90 95

Leu Leu Asp Leu Met Arg Gln Arg Gln Val Val Phe Asp Ser Gly Asp
100 105 110

Arg Glu Met Ala Gln Met Gly Ile Arg Ala Leu Arg Thr Ser Phe Ala
 115 120 125

Tyr Gln Arg Glu Trp Phe Thr Asp Gly Pro Ile Ala Ala Ala Asn Val
 130 135 140

Arg Ser Ala Trp Leu Val Asp Ala Val Pro Val Glu Pro Gly His Ala
 145 150 155 160

His His Pro Ala Gly Arg Val Val Glu Thr Thr Arg Ile Asn Glu Pro
 165 170 175

Glu Met His Asn Pro His Tyr Gln Glu Leu Gln Thr Gln Ala Asn Asp
 180 185 190

Gln Pro Trp Leu Pro Thr Pro Gly Ile Ala Thr Pro Val His Leu Ser
 195 200 205

Ile Pro Gln Ala Ala Ser Val Ala Asp Val Ser Glu Gly Thr Ser Ala
 210 215 220

Ser Leu Ser Phe Ala Cys Pro Asp Trp Ser Pro Pro Ser Ser Asn Gly
 225 230 235 240

Glu Asn Pro Leu Gly Lys Cys Ile Ala Glu Lys Ile Asp Asn Tyr Asn
 245 250 255

Leu Gln Ser Leu Pro Gln Tyr Ala Ser Ser Val Lys Glu Leu Glu Asp
 260 265 270

Thr Pro Val Tyr Leu Arg Gly Ile Lys Thr Gln Lys Thr Phe Met Leu
 275 280 285

Gln Ala Asp Pro Gln Asn Asn Asn Val Phe Leu Val Glu Val Asn Pro
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Lys Gln Lys Ser Ser Phe Pro Gln Thr Ile Phe Phe Trp Asp Val Tyr
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Gln Arg Ile Cys Leu Lys Asp Leu Thr Gly Ala Gln Ile Ser Leu Ser
 325 330 335

Leu Thr Ala Phe Thr Thr Gln Tyr Ala Gly Gln Leu Lys Val His Leu
 340 345 350

Ser Val Ser Ala Val Asn Ala Val Asn Gln Lys Trp Lys Met Thr Pro
 355 360 365

Gln Asp Ser Ala Ile Thr Gln Phe Arg Val Ser Ser Glu Leu Leu Gly
 370 375 380

Gln Thr Glu Asn Gly Leu Phe Trp Asn Thr Lys Ser Gly Gly Ser Gln
 385 390 395 400

His Asp Leu Tyr Val Cys Pro Leu Lys Asn Pro Pro Ser Asp Leu Glu
 405 410 415

Glu Leu Gln Ile Ile Val Asp Glu Cys Thr Thr His Ala Gln Phe Val
 420 425 430

Thr Met Arg Ala Ala Ser Thr Phe Phe Val Asp Val Gln Leu Gly Trp
 435 440 445

Tyr Trp Arg Gly Tyr Tyr Tyr Thr Pro Gln Leu Ser Gly Trp Ser Tyr
 450 455 460

Gln Met Lys Thr Pro Asp Gly Gln Ile Phe Tyr Asp Leu Lys Thr Ser
 465 470 475 480

Lys Ile Phe Phe Val Gln Asp Asn Gln Asn Val Phe Phe Leu His Asn
 485 490 495

Lys Leu Asn Lys Gln Thr Gly Tyr Ser Trp Asp Trp Val Glu Trp Leu
 500 505 510

Lys His Asp Met Asn Glu Asp Lys Asp Glu Asn Phe Lys Trp Tyr Phe
 515 520 525

Ser Arg Asp Asp Leu Thr Ile Pro Ser Val Glu Gly Leu Asn Phe Arg
 530 535 540

His Ile Arg Cys Tyr Ala Asp Asn Gln Gln Leu Lys Val Ile Ile Ser
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Gly Ser Arg Trp Gly Gly Trp Tyr Ser Thr Tyr Asp Lys Val Glu Ser
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Asn Val Glu Asp Lys Ile Leu Val Lys Asp Gly Phe Asp Arg Phe
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 <212> PRT
 <213> Artificial

<220>
 <223> Composite amino acid sequence

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Glu Glu Ile Phe Glu His Gly Phe Ser Thr Leu Gly Asp Val Arg Asn
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 35 40 45

Ser Thr Ser Glu Thr Pro Thr Ala Ala Ile Arg Phe Phe Gly Ser Trp
 50 55 60

Leu Arg Glu Tyr Val Pro Glu His Pro Arg Arg Ala Tyr Leu Tyr Glu
 65 70 75 80

Ile Arg Ala Asp Gln His Phe Tyr Asn Ala Arg Ala Thr Gly Glu Asn
 85 90 95

Leu Leu Asp Leu Met Arg Gln Arg Gln Val Val Phe Asp Ser Gly Asp
 100 105 110

Arg Glu Met Ala Gln Met Gly Ile Arg Ala Leu Arg Thr Ser Phe Ala
 115 120 125

Tyr Gln Arg Glu Trp Phe Thr Asp Gly Pro Ile Ala Ala Ala Asn Val
 130 135 140

Arg Ser Ala Trp Leu Val Asp Ala Val Pro Val Glu Pro Gly His Ala
 145 150 155 160

His His Pro Ala Gly Arg Val Val Glu Thr Thr Arg Ile Asn Glu Pro
 165 170 175

Glu Met His Asn Pro His Tyr Gln Glu Leu Gln Thr Gln Ala Asn Asp
 180 185 190

Gln Pro Trp Leu Pro Thr Pro Gly Ile Ala Thr Pro Val His Leu Ser
 195 200 205

Ile Pro Gln Ala Ala Ser Val Ala Asp Val Ser Glu Gly Thr Ser Ala
 210 215 220

Ser Leu Ser Phe Ala Cys Pro Asp Trp Ser Pro Pro Ser Ser Asn Gly
 225 230 235 240

Glu Asn Pro Leu Gly Lys Cys Ile Ala Glu Lys Ile Asp Asn Tyr Asn
 245 250 255

Leu Gln Ser Leu Pro Gln Tyr Ala Ser Ser Val Lys Glu Leu Glu Asp
 260 265 270

Thr Pro Val Tyr Leu Arg Gly Ile Lys Thr Gln Lys Thr Phe Met Leu
 275 280 285

Gln Ala Asp Pro Gln Asn Asn Asn Val Phe Leu Val Glu Val Asn Pro
 290 295 300

Lys Gln Lys Pro Ser Phe Pro Gln Thr Ile Phe Phe Trp Asp Val Tyr
 305 310 315 320

Gln Arg Ile Cys Leu Lys Asp Leu Thr Gly Ala Gln Ile Ser Leu Ser
 325 330 335

Leu Thr Ala Phe Thr Thr Gln Tyr Ala Gly Gln Leu Lys Val His Leu
 340 345 350

Ser Val Ser Ala Val Asn Ala Val Asn Gln Lys Trp Lys Met Thr Pro
 355 360 365

Gln Asp Ser Ala Ile Thr Gln Phe Arg Val Ser Ser Glu Leu Leu Gly
 370 375 380

Gln Thr Glu Asn Gly Leu Ser Arg Asn Thr Lys Ser Gly Gly Ser Gln
 385 390 395 400

His Asp Leu Tyr Val Cys Pro Leu Lys Asn Pro Pro Ser Asp Leu Glu
 405 410 415

Glu Leu Gln Ile Ile Val Asp Glu Cys Thr Thr His Ala Gln Phe Val
 420 425 430

Thr Met Arg Ala Ala Ser Thr Phe Phe Val Asp Val Gln Leu Gly Trp
 435 440 445

Tyr Trp Arg Gly Tyr Tyr Tyr Thr Pro Gln Leu Ser Gly Trp Ser Tyr

450	455	460	
Gln Met Lys Thr Pro Asp Gly Gln Ile Phe Tyr Asp Leu Lys Thr Ser			
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Lys Ile Phe Phe Val Gln Asp Asn Gln Asn Val Phe Phe Leu His Asn			
	485	490	495
Lys Leu Asn Lys Gln Thr Gly Tyr Ser Trp Asp Trp Val Glu Trp Leu			
	500	505	510
Lys His Asp Met Asn Glu Asp Lys Asp Glu Asn Phe Lys Trp Tyr Phe			
	515	520	525
Ser Arg Asp Asp Leu Thr Ile Pro Ser Val Glu Gly Leu Asn Phe Arg			
	530	535	540
His Ile Arg Cys Tyr Ala Asp Asn Gln Gln Leu Lys Val Ile Ile Ser			
	545	550	555
Gly Ser Arg Trp Gly Gly Trp Tyr Ser Thr Tyr Asp Lys Val Glu Ser			
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Asn Val Glu Asp Lys Ile Leu Val Lys Asp Gly Phe Asp Arg Phe			
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 <213> Mycoplasma pneumoniae

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tgatgacctt accattcctt ccgttgaagg gcttaacttc cgccacattc gctgttacgc     1680
tgacaaccag cagttaaagg tgatcataag cggttcacgt tggggcgggt ggtactccac     1740
ttacgataaa gttgaaagta atgtcgaaga taagattttg gtcaaagatg gttttgatcg     1800
cttttagcga ttaagcttta acgtcactgt tttgctctaa tgttagaagc aaagatcttg     1860

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<210> 8

<211> 1773

<212> DNA

<213> Artificial

<220>

<223> S1 nucleotide sequence with tga codons changed to tgg for expression in E. coli

<400> 8

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atgccaaatc ctggttagatt tgtttaccgt gttgatttga gaagccctga agaaattttt      60
gaacatggct tttcaacttt aggtgatgtg agaaatttct ttgaacacat tccctccact     120
aattttggta gaagctatct tatttccact tcagaaacac ccacagcagc tattcgcttc     180
tttggttagct gggttacggga atatgtacca gagcacccca gaagggtta cttatatgaa     240

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attcgtgccg accaactt ttacaatgcc cgcgccactg gggagaactt gttagattta 300
atgctgcaaa gacaagtagt atttgactct ggtgatcgag aaatggcaca aatgggaatt 360
agagctttac gcacttcctt tgcgtatcaa cgtgaatggg ttaccgatgg tccaattgca 420
gcagctaata tccgtagtgc ttggctagta gatgctgttc ccgttgaacc tggatcatgct 480
caccacccgg ctggctgtgt tgtagagact actagaatta atgaaccgga aatgcacaac 540
cctcattatc aagagctgca aacccaagcc aatgatcaac catggttgcc aacaccagga 600
atagctactc ctgtacattt atcaattccc caagcagctt ccgttgctga tgtttcggaa 660
ggtacttccg ctctgctatc gtttgctgct cctgattgga gtccaccttc tagtaatggt 720
gaaaatccgc tagacaaatg cattgcggaa aagattgata actataacct acaatcctta 780
ccacagtacg ctagcagtgt aaaggaactg gaagatacac cagtatacct aaggggaatt 840
aaaacgcaaa aaacctttat gttacaagca gatccgcaaa ataacaatgt ctttttggtc 900
gaagtaaacc ccaaacaaaa gccagctttt ccccaaacca tcttcttttg ggatgtttat 960
caacgaattt gtctcaagga tttaactggg gcacaaatca gtctttcgtc tactgccttt 1020
actactcagt atgctgggtc gctcaaagtg caccttagtg ttagcgcggg taatgccgtg 1080
aaccaaaagt ggaaaatgac accgcaagac agtgcaataa ctcagtttcg ggtctcctct 1140
gaactgttag gtcaaactga aaatggcttg tcctggaata ccaagagtgg tggttcacia 1200
cacgatttgt atgtatgtcc ttgaaaaat ccacctagtg atttggaaga attacaaata 1260
attgttgatg aatgtactac ccatgcgcag ttgttacta tgcgtgcagc tagcaccttc 1320
ttgttgatg ttcagctagg ctggtattgg aggggttatt actatacccc acaattaagt 1380
ggttggtctt atcagatgaa aacaccagat ggacagatat tctatgatct aaaaacttcg 1440
aaaatcttct ttgtccagga caacaaaaac gtgttctttc tccataataa actcaacaaa 1500
caaactgggt acagctggga ttgggtagaa tggctaaaac atgacatgaa tgaggacaaa 1560
gacgaaaact ttaaattgga cttttcgcgt gatgacctta ccattccttc cgttgaaggg 1620
cttaacttcc gccacattcg ctgttacgct gacaaccagc agttaaaggt gatcataagc 1680
ggttcacgtt ggggcggttg gtactccact tacgataaag ttgaaagtaa tgtcgaagat 1740
aagatttttg tcaaagatgg ttttgatcgc ttt 1773

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<210> 9

<211> 1773

<212> DNA

<213> Artificial

<220>

<223> L2 nucleotide sequence with tga codons changed to tgg for expression in E. Coli

<400> 9
 atgccaaatc ctggttagatt tgtttaccgt gttgatttga gaagccctga agaaatTTTT 60
 gaacatggct tttcaacttt aggtgatgtg agaaatTTTct ttgaacacat tctctccact 120
 aattttggta gaagctatTTt tatttccact tcagaaacac ccacagcagc tattcgcttc 180
 tttggtagct ggttacggga atatgtacca gagcacccca gaagggctta cttatatgaa 240
 attcgtgccg accaactctt ttacaatgcc cgcgccactg gggagaactt gttagattta 300
 atgcgtcaaa gacaagtagt atttgactct ggtgatcgag aaatggcaca aatgggaatt 360
 agagctttac gcacttcctt tgcgtatcaa cgtgaatggg ttaccgatgg tccaattgca 420
 gcagctaattg tccgtagtgc ttggctagta gatgctgttc ccgttgaacc tggtcatgct 480
 caccacccgg ctggtcgtgt tgtagagact actagaatta atgaaccgga aatgcacaac 540
 cctcattatc aagagctgca aacccaagcc aatgatcaac catggttgcc aacaccagga 600
 atagctactc ctgtacattt atcaattccc caagcagctt ccgttgctga tgtttcggaa 660
 ggtacttccg cttcgctatc gtttgctgct cctgattgga gtccaccttc tagtaatggg 720
 gaaaatccgc taggcaaagc cattgcggaa aagattgata actataacct acaatcctta 780
 ccacagtacg ctagcagtgt aaaggaactg gaagatacac cagtatacct aaggggaatt 840
 aaaacgcaaa aaacctttat gttacaagca gatccgcaaa ataacaatgt ctttttggtc 900
 gaagtaaacc ccaaacaaaa gtccagcttt ccccaaacca tcttcttttg ggatgtttat 960
 caacgaattt gtctcaagga tttaactggg gcacaaatca gtctttcgct tactgccttt 1020
 actactcagt atgctggcca gctcaaagtg caccttagtg ttagcgcggg taatgccgtg 1080
 aaccaaagt ggaaaatgac accgcaagac agtgcaataa ctcagtttcg ggtctcctct 1140
 gaactgtag gtcaaactga aaatggcttg ttctggaata ccaagagtgg tggttcacia 1200
 cacgatttgt atgtatgtcc tttgaaaaat ccacctagtg atttggaaga attacaaata 1260
 attgttgatg aatgtactac ccatgcgcag tttgttacta tgcgtgcagc tagcaccttc 1320
 tttgttgatg ttcagctagg ctggtattgg aggggttatt actatacccc acaattaagt 1380
 ggttggctct atcagatgaa aacaccagat ggacagatat tctatgatct aaaaacttcg 1440
 aaaatcttct ttgtccagga caacaaaaac gtgttctttc tccataataa actcaacaaa 1500
 caaactggtt acagctggga ttgggtagaa tggctaaaac atgacatgaa tgaggacaaa 1560
 gacgaaaact ttaaatggta cttttcgcgt gatgacctta ccattccttc cgttgaaggg 1620
 cttaacttcc gccacattcg ctgttacgct gacaaccagc agttaaggt gatcataagc 1680
 ggttcacgtt ggggcgggtg gtactccact tacgataaag ttgaaagtaa tgtcgaagat 1740
 aagatTTTgg tcaaagatgg ttttgatcgc ttt 1773

<210> 10
 <211> 1773
 <212> DNA
 <213> Artificial

<220>
 <223> JL nucleotide sequence with tga codons changed to tgg for
 expression in E. coli

<400> 10
 atgccaaatc ctgttagatt tgtttaccgt gttgatttga gaagccctga agaaatTTTT 60
 gaacatggct tttcaacttt aggtgatgtg agaaatTTTct ttgaacacat tctctccact 120
 aatttttggtga gaagctattt tatttccact tcagaaacac ccacagcagc tattcgcttc 180
 tttggtagct gggtacggga atatgtacca gagcacccca gaagggctta cttatatgaa 240
 attcgtgccg accaacactt ttacaatgcc cgcgcactg gggagaactt gttagattta 300
 atgcgtcaaa gacaagtagt atttgactct ggtgatcgag aaatggcaca aatgggaatt 360
 agagctttac gcacttcctt tgcgtatcaa cgtgaatggg ttaccgatgg tccaattgca 420
 gcagctaattg tccgtagtgc ttggctagta gatgctgttc ccgttgaacc tggtcatgct 480
 caccaccggg ctggtcgtgt tgtagagact actagaatta atgaaccgga aatgcacaac 540
 cctcattatc aagagctgca aaccaagcc aatgatcaac catgggtgcc aacaccagga 600
 atagctactc ctgtacattt atcaattccc caagcagctt ccgttgctga tgtttcggaa 660
 ggtacttccg cttcgctatc gtttgctgct cctgattgga gtccaccttc tagtaatggg 720
 gaaaatccgc tagacaaatg cattgcggaa aagattgata actataacct acaatcctta 780
 ccacagtacg ctagcagtgt aaaggaactg gaagatacac cagtatacct aaggggaatt 840
 aaaacgcaaa aaacctttat gttacaagca gatccgcaaa ataacaatgt ctttttggtc 900
 gaagtaaac ccaacaaaa gtccagcttt ccccaaacca tcttcttttg ggatgtttat 960
 caacgaattt gtctcaagga tttaactggg gcacaaatca gtctttcgct tactgccttt 1020
 actactcagt atgctggtca gctcaaagtg caccttagtg ttagcgcggt taatgccgtg 1080
 aaccaaagt ggaaatgac accgcaagac agtgcaataa ctcagtttcg ggtctcctct 1140
 gaactgttag gtcaaactga aaatggcttg ttctggaata ccaagagtgg tggttcacia 1200
 cacgatttgt atgtatgtcc tttgaaaaat ccacctagtg atttggaga attacaaata 1260
 attgttgatg aatgtactac ccacgcgcag tttgttacta tgcgtgcagc tagcaccttc 1320
 tttgttgatg ttcagctagg ctggtattgg aggggttatt actatacccc acaattaagt 1380
 ggttggtctt atcagatgaa aacaccagat ggacagatat tctatgatct aaaaacttcg 1440
 aaaatcttct ttgtccagga caacaaaaac gtgttctttc tccataataa actcaacaaa 1500

caaactgggtt acagctggga ttgggtagaa tggctaaaac atgacatgaa tgaggacaaa 1560
 gacgaaaact ttaaattggta ctttttcgct gatgacctta ccattccttc cgttgaaggg 1620
 cttaacttcc gccacattcg ctgttacgct gacaaccagc agttaaggt gatcataagc 1680
 gggttcacgtt ggggcggttg gtactccact tacgataaag ttgaaagtaa tgtcgaagat 1740
 aagatttttg tcaaagatgg ttttgatcgc ttt 1773

<210> 11

<211> 1773

<212> DNA

<213> Artificial

<220>

<223> RJL1 nucleotide sequence with tga codons changed to tgg for expression in E. coli

<400> 11

atgccaaatc ctgtagatt tgtttaccgt gttgattga gaagccctga agaaattttt 60
 gaacatggct tttcaacttt aggtgatgtg agaaatttct ttgaacacat tctctccact 120
 aattttggta gaagctatct tatttccact tcagaaacac ccacagcagc tattcgcttc 180
 tttggtagct gggttacggga atatgtacca gagcacccca gaagggctta cttatatgaa 240
 attcgtgccg accaacactt ttacaatgcc cgcgccactg gggagaactt gtttagattta 300
 atgcgtcaaa gacaagtagt atttgactct ggtgatcgag aaatggcaca aatgggaatt 360
 agagctttac gcacttcctt tgcgtatcaa cgtgaatggg ttaccgatgg tccaattgca 420
 gcagctaatag tccgtagtgc ttggctagta gatgctgttc ccgttgaacc tggatcatgct 480
 caccacccgg ctggctcgtg tgtagagact actagaatta atgaaccgga aatgcacaac 540
 cctcattatc aagagctgca aacccaagcc aatgatcaac catgggttgc aacaccagga 600
 atagctactc ctgtacattt atcaattccc caagcagctt ccgttgctga tgtttcggaa 660
 ggtacttccg cttcgctatc gtttgctgc cctgattgga gtccaccttc tagtaatggt 720
 gaaaatccgc tagacaaatg cattgcggaa aagattgata actataacct acaatcctta 780
 ccacagtacg ctagcagtgt aaaggaactg gaagatacac cagtatacct aaggggaatt 840
 aaaacgcaaa aaacctttat gttacaagca gatccgcaaa ataacaatgt ctttttggtc 900
 gaagtaaacc ccaaacaaaa gtccagcttt ccccaaacca tcttcttttg ggatgtttat 960
 caacgaattt gtctcaagga tttactgggt gcacaaatca gtctttcgtt tactgccttt 1020
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 aacaaaaagt ggaaaatgac accgcaagac agtgcaataa ctcagtttcg ggtctcctct 1140
 gaactgtagt gtcaaactga aaatggcttg ttccggaata ccaagagtgg tggttcacia 1200

cacgatttgt atgtatgtcc ttgaaaaat ccacctagtg atttggaaga.attacaaata 1260
 attgttgatg aatgtactac ccatgcgcag ttgttacta tgcgtgcage tagcaccttc 1320
 ttgttgatg ttcagctagg ctggtattgg aggggttatt actatacccc acaattaagt 1380
 gggttggtcctt atcagatgaa aacaccagat ggacagatat tctatgatct aaaaacttcg 1440
 aaaatcttct ttgtccagga caacccaaac gtgttctttc tccataataa actcaacaaa 1500
 caaactgggtt acagctggga ttgggtagaa tggctaaaac atgacatgaa tgaggacaaa 1560
 gacgaaaact ttaaatggta cttttcgcgt gatgacctta ccattccttc cgttgaaggg 1620
 cttaacttcc gccacattcg ctgttacgct gacaaccagc agttaaagggt gatcataagc 1680
 ggttcacggt ggggcgggtg gtactccact tacgataaag ttgaaagtaa tgtcgaagat 1740
 aagatttttg tcaaagatgg ttttgatcgc ttt 1773

<210> 12
 <211> 24
 <212> DNA
 <213> Artificial

<220>
 <223> Oligonucleotide primer

<400> 12
 tttttacata tgccaaatcc tggt 24

<210> 13
 <211> 28
 <212> DNA
 <213> Artificial

<220>
 <223> Oligonucleotide primer

<400> 13
 cgtaaagga tcctcgctaa aagcgatc 28

<210> 14
 <211> 25
 <212> DNA
 <213> Artificial

<220>
 <223> Oligonucleotide primer

<400> 14
 ctagccaagc actacggaca ttagc 25

<210> 15
 <211> 27
 <212> DNA

<213> Artificial

<220>

<223> Oligonucleotide primer

<400> 15

cgtagtgctt ggctagtaga tgctggt

27

<210> 16

<211> 23

<212> DNA

<213> Artificial

<220>

<223> Oligonucleotide primer

<400> 16

cctgggtgttg gcaaccatgg ttg

23

<210> 17

<211> 23

<212> DNA

<213> Artificial

<220>

<223> Oligonucleotide primer

<400> 17

gatcaaccat gggttgccaac acc

23

<210> 18

<211> 24

<212> DNA

<213> Artificial

<220>

<223> Oligonucleotide primer

<400> 18

aaggtggact ccaatcaggg cacg

24

<210> 19

<211> 24

<212> DNA

<213> Artificial

<220>

<223> Oligonucleotide primer

<400> 19

cgtgccctga ttggagtcca cctt

24

<210> 20

<211> 23

<212> DNA

<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 20
gcggtgtcat tttccacttt tgg 23

<210> 21
<211> 23
<212> DNA
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<220>
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<400> 21
ccaaaagtgg aaaatgacac cgc 23

<210> 22
<211> 22
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 22
ggtattccag aacaagccat tt 22

<210> 23
<211> 24
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 23
gcttggttctg gaataccaag agtg 24

<210> 24
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 24
ataacccta taccagcta g 21

<210> 25
<211> 59
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 25
gctggtattg gaggggttat tactataccc cacaattaag tggttggtct tatcagatg 59

<210> 26
<211> 24
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 26
ccattctacc caatcccagc tgta 24

<210> 27
<211> 24
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 27
tacagctggg attgggtaga atgg 24

<210> 28
<211> 24
<212> DNA
<213> Mycoplasma pneumoniae

<400> 28
ttttttaaaaa tgccaaatcc tggt 24

<210> 29
<211> 20
<212> DNA
<213> Mycoplasma pneumoniae

<400> 29
aatgtccgta gtgcttgact 20

<210> 30
<211> 20
<212> DNA
<213> Artificial

<220>
<223> Modified M129/B9 sequence

<400> 30
aatgtccgta gtgcttggt 20

<210> 31
<211> 20
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 31
agccaagcac tacggacatt 20

<210> 32
<211> 22
<212> DNA
<213> Mycoplasma pneumoniae

<400> 32
tgcttgacta gtagatgctg tt 22

<210> 33
<211> 22
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<220>
<223> Oligonucleotide primer

<400> 33
tgcttgacta gtagatgctg tt 22

<210> 34
<211> 18
<212> DNA
<213> Mycoplasma pneumoniae

<400> 34
atgattgcca acaccagg 18

<210> 35
<211> 18
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<220>
<223> Modified M129/B9 sequence

<400> 35
atgggtgcca acaccagg 18

<210> 36
<211> 18
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 36
cctggtgttg gcaaccat 18

<210> 37
<211> 18
<212> DNA
<213> Mycoplasma pneumoniae

<400> 37
accatgattg ccaacacc 18

<210> 38
<211> 18
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 38
accatggttg ccaacacc 18

<210> 39
<211> 19
<212> DNA
<213> Mycoplasma pneumoniae

<400> 39
cctgattgaa gtccacctt 19

<210> 40
<211> 19
<212> DNA
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<220>
<223> Modified M129/B9 sequence

<400> 40
cctgattgga gtccacctt 19

<210> 41
<211> 19
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 41
aagggtggact ccaatcagg 19

<210> 42
<211> 18

<212> DNA
<213> *Mycoplasma pneumoniae*

<400> 42
cgtgccctga ttgaagtc 18

<210> 43
<211> 18
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 43
cgtgccctga ttggagtc 18

<210> 44
<211> 20
<212> DNA
<213> *Mycoplasma pneumoniae*

<400> 44
aaagtgaaaa atgacaccgc 20

<210> 45
<211> 20
<212> DNA
<213> Artificial

<220>
<223> Modified M129/B9 sequence

<400> 45
aaagtggaaa atgacaccgc 20

<210> 46
<211> 20
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 46
gcggtgtcat tttccacttt 20

<210> 47
<211> 20
<212> DNA
<213> *Mycoplasma pneumoniae*

<400> 47
caaaagtgaa aaatgacacc 20

<210> 48
<211> 20
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 48
caaaagtgga aaatgacacc 20

<210> 49
<211> 22
<212> DNA
<213> Mycoplasma pneumoniae

<400> 49
aaatggcttg ttctgaaata cc 22

<210> 50
<211> 22
<212> DNA
<213> Artificial

<220>
<223> Modified M129/B9 sequence

<400> 50
aaatggcttg ttctggaata cc 22

<210> 51
<211> 23
<212> DNA
<213> Mycoplasma pneumoniae

<400> 51
gcttggttctg aaataccaag agt 23

<210> 52
<211> 23
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 52
gcttggttctg gaataccaag agt 23

<210> 53
<211> 20
<212> DNA
<213> Mycoplasma pneumoniae

<400> 53
taggctggta ttgaaggggt 20

<210> 54
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 <212> DNA
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<220>
 <223> Modified M129/B9 sequence

<400> 54
 taggctggta ttggaggggt 20

<210> 55
 <211> 17
 <212> DNA
 <213> Artificial

<220>
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<400> 55
 acccctatac cagccta 17

<210> 56
 <211> 56
 <212> DNA
 <213> Mycoplasma pneumoniae

<400> 56
 ggtattgaag gggttattac tataccccac aattaagtgg ttgatcttat cagatg 56

<210> 57
 <211> 56
 <212> DNA
 <213> Artificial

<220>
 <223> Oligonucleotide primer

<400> 57
 ggtattggag gggttattac tataccccac aattaagtgg ttggtcttat cagatg 56

<210> 58
 <211> 21
 <212> DNA
 <213> Mycoplasma pneumoniae

<400> 58
 tacagctggg attgagtaga a 21

<210> 59
 <211> 21
 <212> DNA
 <213> Artificial

<220>
<223> Modified M129/B9 sequence

<400> 59
tacagctggg attgggtaga a 21

<210> 60
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 60
ttctacccaa tcccagctgt a 21

<210> 61
<211> 21
<212> DNA
<213> Mycoplasma pneumoniae

<400> 61
tacagctggg attgagtaga a 21

<210> 62
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer

<400> 62
tacagctggg attgggtaga a 21

<210> 63
<211> 28
<212> DNA
<213> Mycoplasma pneumoniae

<400> 63
gatcgctttt agcgattaag ctttaacg 28

<210> 64
<211> 28
<212> DNA
<213> Artificial

<220>
<223> Modified M129/B9 sequence

<400> 64
gatcgctttt agcgaggatc ctttaacg 28

<210> 65
 <211> 28
 <212> DNA
 <213> Artificial

<220>
 <223> Oligonucleotide primer

<400> 65
 ggatcctcta cgcaatgcat ttgtctag

28

<210> 66
 <211> 28
 <212> DNA
 <213> Artificial

<220>
 <223> Oligonucleotide primer

<400> 66
 catatgccaa caccaggaat agctactc

28

<210> 67
 <211> 25
 <212> DNA
 <213> Artificial

<220>
 <223> Oligonucleotide primer

<400> 67
 ggatccacta ccagcctagc tgaac

25

<210> 68
 <211> 29
 <212> DNA
 <213> Artificial

<220>
 <223> Oligonucleotide primer

<400> 68
 catatgggtc agtcaaagt gcaccttag

29

<210> 69
 <211> 249
 <212> PRT
 <213> Mycoplasma pneumoniae

<400> 69

Met Pro Asn Pro Val Arg Phe Val Tyr Arg Val Asp Leu Arg Ser Pro
 1 5 10 15

Glu Glu Ile Phe Glu His Gly Phe Ser Thr Leu Gly Asp Val Arg Asn
 20 25 30

Phe Phe Glu His Ile Leu Ser Thr Asn Phe Gly Arg Ser Tyr Phe Ile
 35 40 45

Ser Thr Ser Glu Thr Pro Thr Ala Ala Ile Arg Phe Phe Gly Ser Trp
 50 55 60

Leu Arg Glu Tyr Val Pro Glu His Pro Arg Arg Ala Tyr Leu Tyr Glu
 65 70 75 80

Ile Arg Ala Asp Gln His Phe Tyr Asn Ala Arg Ala Thr Gly Glu Asn
 85 90 95

Leu Leu Asp Leu Met Arg Gln Arg Gln Val Val Phe Asp Ser Gly Asp
 100 105 110

Arg Glu Met Ala Gln Met Gly Ile Arg Ala Leu Arg Thr Ser Phe Ala
 115 120 125

Tyr Gln Arg Glu Trp Phe Thr Asp Gly Pro Ile Ala Ala Ala Asn Val
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